CLAIMS

1. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein a smooth face is formed on a surface of the pre-preg sheet.

2. The method of claim 1, wherein the pre-preg sheet includes:

a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion; and

a resin layer formed on a surface of the fiber sheet and made of material identical to the resin material, the resin layer having a smooth surface.

3. The method of claim 2, further comprising the step of forming the resin layer when the fiber sheet is impregnated with the resin material.

4. The method of claim 2 or 3, wherein a thickness of the resin layer ranges from 1μm to 30μm.

5. A method of manufacturing a clad board for forming circuitry,

comprising the steps of:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the pre-preg sheet includes a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion, and

wherein the fiber sheet has a density ranging from 700kg/m^3 to 1000kg/m^3.

6. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

piercing a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the pre-preg sheet includes a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion, and

wherein the fiber sheet includes:

a first layer at a surface thereof; and

a second layer other than the first layer, the second

layer having a density lower than a density of the first layer.

7. The method of claim 6, wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3.

8. The method of claim 6 or 7, wherein the density of the second layer ranges from 500kg/m^3 to 700kg/m^3.

9. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

piercing a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the pre-preg sheet includes a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion, and

wherein the fiber sheet includes first and second layers having respective densities different from each other.

10. The method of claim 9, wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3, and the density of the second layer is lower than the density of the first layer.

11. The method of claim 9 or 10, wherein the density of the second

layer ranges from 500kg/m^3 to 700kg/m^3.

12. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

piercing a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the pre-preg sheet includes a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion, and

wherein the fiber sheet includes:

first and second layers located at respective surfaces thereof; and

a third layer located between the first and second layers.

13. The method of claim 12, wherein the first and second layers have respective densities ranging from 700kg/m^3 to 1000kg/m^3.

14. The method of claim 12 or 13, wherein the third layer has a density ranging from 500kg/m^3 to 700kg/m^3.

15. The method of any one of claims 1 to 29, wherein a maximum height difference in roughness at a surface of the pre-preg sheet is not more

than 10μm.

16. The method of any one of claims 1 to 15, wherein the conductive paste includes a conductive particle made by processing a spherical conductive particle into a non-spherical conductive particle.

17. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

smoothing a surface of a pre-preg sheet with smoothing means;

sticking a releasing film to the pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the pre-preg sheet includes a fiber sheet impregnated with resin material containing at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

18. The method of claim 17, wherein the smoothing means includes a blade at a tip thereof.

19. The method of claim 17, wherein the smoothing means is shaped in one of roll and flat board.

20. The method of claim 18 or 19, further comprising the step of setting a temperature of the smoothing means not lower than a melting

temperature of the resin material.

21. The method of any one of claims 18 to 20 further comprising the step of setting a temperature of the pre-preg sheet not lower than a melting temperature of the resin material.

22. The method of any one of claims 5 to 21, wherein the pre-preg sheet includes a resin layer covering the fiber sheet, having a thickness ranging from 1μm to 30μm, and having a smooth surface.

23. The method of any one of claims 18 to 22, wherein a maximum height difference in roughness at a surface of the pre-preg sheet is not more than 10μm, the surface being smoothed by the smoothing means.

24. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the conductive paste containing a conductive particle having a diameter greater than a size of a gap in a thickness direction, the gap being produced at an interface between the releasing film and the pre-preg sheet in one of said step of sticking the releasing film and said step of forming the hole.

25. The method of claim 24, wherein the conductive paste containing a conductive particle made by processing a spherical conductive particle into a non-spherical shape.

26. The method of claim 25, wherein the conductive particle is a flat conductive particle produced by applying a mechanical force to the spherical conductive particle.

27. The method of any one of claims 24 to 26, wherein the conductive particle has a longest diameter smaller than a diameter of the hole.

28. The method of any one of claims 24 to 27, wherein the conductive particle containing copper.

29. The method of any one of claims 24 to 28, wherein the pre-preg sheet includes a fiber sheet impregnated with at least one of thermoplastic resin and thermosetting resin including semi-cured portion.

30. A method of manufacturing a clad board for forming circuitry, comprising the steps of:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

wherein the conductive paste includes a non-spherical conductive particle.

31. The method of claim 30, wherein the conductive paste includes a conductive particle made by processing a spherical conductive particle into a non-spherical shape.

32. The method of claim 31, wherein the conductive particle is a flat conductive particle produced by applying a mechanical force to the spherical conductive particle.

33. The method of any one of claims 30 to 32, wherein the conductive particle has a longest diameter smaller than a diameter of the hole.

34. The method of any one of claims 30 to 33, wherein the conductive particle contains copper.

35. The method of any one of claims 30 to 34, wherein the pre-preg sheet includes a fiber sheet impregnated with at least one of thermoplastic resin and thermosetting resin including semi-cured portion.

36. The method of any one of claims 1 to 35, further comprising the step of forming a circuit by etching the metal foil.

37. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film,the

hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said clad board comprising:

a fiber sheet included in the pre-preg sheet;

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion; and

a resin layer formed smoothly on the fiber sheet, the resin layer being made of material identical to the resin material.

38. The clad board of claim 37, wherein the resin layer is formed when the resin material is impregnated into the fiber sheet.

39. The clad board of claim 37 or 38, wherein a thickness of the resin layer ranges from 1μm to 30μm.

40. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said board comprising:

a fiber sheet included in the pre-preg sheet, having a density

ranging from 700kg/m^3 to 1000kg/m^3; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

41. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said board comprising:

a fiber sheet included in the pre-preg sheet;

a first layer included in the fiber sheet and disposed at a surface of the fiber sheet;

a second layer included in the fiber sheet, the second layer having a density lower than a density of the first layer; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

42. The clad board of claim 41, wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3.

43. The clad board of claim 41 or 42, wherein the density of the second layer ranges from 500kg/m^3 to 700kg/m^3.

44. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said board comprising:

a fiber sheet included in the pre-preg sheet;

a first layer included in said fiber sheet;

a second layer included in said fiber sheet, the second layer having a density different from a density of the first layer; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

45. The clad board of claim 44,

wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3, and

wherein the density of the second layer is lower than the density of the first layer.

46. The clad board of claim 44 or 45, wherein the density of the second layer ranges from 500kg/m^3 to 700kg/m^3.

47. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said board comprising:

a fiber sheet included in the pre-preg sheet;

first and second layers included in the fiber sheet, being disposed on respective surfaces of the fiber sheet;

a third layer included in the fiber sheet, being located between the first and second layers, the third layer having a density lower than respective densities of the first and second layers; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

48. The clad board of claim 47, wherein respective densities of the first and second layers range from 700kg/m^3 to 1000kg/m^3.

49. The clad board of claim 47 or 48, wherein the density of the third layer ranges from 500kg/m^3 to 700kg/m^3.

50. The clad board of any one of claims 37 to 49, further comprising a smooth resin layer formed on a surface of the fiber sheet, the smooth resin layer having a thickness ranging from 1μm to 30μm.

51. The clad board of any one of claims 37 to 50, wherein a maximum height difference in roughness at a surface of the pre-preg sheet is not more than 10μm.

52. The clad board of any one of claims 37 to 51, wherein the conductive paste includes a conductive particle made by processing a spherical conductive particle into a non-spherical shape.

53. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet with the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said clad board comprising:

a conductive particle included in the conductive paste, the conductive particle has a longest diameter greater than a size of a gap, in a thickness direction, produced at an interface between the releasing film and the pre-preg sheet in one of the sticking of the releasing film and the forming of the hole

54. The clad board of claim 53, wherein the conductive particle is made by processing a spherical conductive particle into a non-spherical shape.

55. The clad board of claim 53, wherein the conductive particle is a

flat conductive particle produced by applying a mechanical force.

56. The clad board of any one of claims 53 to 55, wherein the conductive particle has a longest diameter is smaller than a diameter of the hole.

57. The clad board of any one of claims 53 to 56, wherein the conductive particle contains copper.

58. The clad board of any one of claims 37 to 57, wherein the pre-preg sheet includes:

a fiber sheet; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

59. A clad board for forming circuitry, being manufactured through:

sticking a releasing film to a pre-preg sheet;

forming a hole in the pre-preg sheet including the releasing film, the hole being one of a non-through-hole and a through-hole;

filling the hole with conductive paste;

peeling off the releasing film; and

heating and pressing a metal foil onto the pre-preg sheet,

said clad board comprising:

a conductive particle included in the conductive paste, being shaped in non-spherical.

60. The clad board of claim 59, wherein the conductive particle is made by processing a spherical conductive particle into a non-spherical shape.

61. The clad board of claim 59, wherein the conductive particle is a flat conductive particle produced by applying a mechanical force.

62. The clad board of any one of claims 59 to 61, wherein the conductive particle has a longest diameter smaller than a diameter of the hole.

63. The clad board of any one of claims 59 to 62, wherein the conductive particle containing copper.

64. The clad board of any one of claims 59 to 63, wherein the pre-preg sheet includes:

a fiber sheet; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

65. The clad board of any one of claims 37 to 64, further comprising a circuit made by etching the metal foil.

66. A core board for a clad board for forming circuitry, comprising:

a fiber sheet;

resin material impregnated into the fiber sheet, the resin

material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion; and

a resin layer formed on the fiber sheet, being made of material identical to the resin material.

67. The core board of claim 66, wherein the resin layer is formed when the resin material is impregnated in the fiber sheet.

68. The core board of claim 66 or 67, wherein the resin material has a thickness ranging from 1μm to 30μm.

69. A core board for a clad board for forming circuitry, comprising:

a fiber sheet having a density ranging from 700kg/m^3 to 1000kg/m^3; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

70. A core board for a clad board for forming circuitry, comprising:

a fiber sheet;

a first layer included in the fiber sheet and disposed at a surface of the fiber sheet;

a second layer included in the fiber sheet, having a density lower than a density of the first layer; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

71. The core board of claim 70, wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3.

72. The core board of claim 70 or 71, wherein the density of the second layer ranges from 500kg/m^3 to 700kg/m^3.

73. A core board for a clad board for forming circuitry, comprising:

a fiber sheet;

a first layer included in the fiber sheet;

a second layer included in the fiber sheet, having a density different from a density of the first layer; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

74. The core board of claim 73,

wherein the density of the first layer ranges from 700kg/m^3 to 1000kg/m^3, and

wherein the density of the second layer is lower than the density of the first layer.

75. The core board of claim 73 or 74, wherein the density of the second layer ranges from 500kg/m^3 to 700kg/m^3.

76. A core board for a clad board for forming circuitry, comprising:

a fiber sheet;

first and second layers included in the fiber sheet, being disposed on respective outermost sides of the fiber sheet;

a third layer included in said fiber sheet, being located between the first and second layers, having a density lower than respective densities of the first and second layers; and

resin material impregnated into the fiber sheet, the resin material including at least one of thermoplastic resin and thermosetting resin having semi-cured portion.

77. The core board of claim 76, wherein respective densities of the first and second layers range from 700kg/m^3 to 1000kg/m^3.

78. The core board of claim 76 or 77, wherein the density of the third layer ranges from 500kg/m^3 to 700kg/m^3.

79. The core board of any one of claims 66 to 78, further comprising a smooth resin layer formed on the fiber sheet, the smooth resin layer having a thickness ranging from 1μm to 30μm.

80. The core board of any one of claims 66 to 79, wherein a maximum height difference in roughness on a surface of the pre-preg sheet is not more than 10μm.